

## Series TY-B and TY-FRB — 5.6 and 8.0 K-factor Upright and Pendent Sprinklers Alternate Materials Of Construction

### General Description

The Series TY-B and TY-FRB, 5.6 and 8.0 K-factor, Upright and Pendent Sprinklers described in this data sheet are corrosion resistant, standard coverage spray sprinklers designed for use in commercial occupancies where corrosive atmospheres may exist. The TY-B with its 5 mm diameter heat sensitive glass bulb is rated standard response, whereas the TY-FRB with its 3 mm diameter heat sensitive glass bulb is rated quick response.

The alternate materials of construction for the TY-B and TY-FRB Sprinklers, i.e. Stainless Steel, SMO, or Titanium are utilized to extend the life of a sprinkler beyond that which might be expected of copper alloy sprinklers exposed to corrosive atmospheres. Although corrosion resistant sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these alternate materials of construction for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum,

#### IMPORTANT

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

along with the corrosive nature of the chemical to which the sprinklers will be exposed.

#### WARNINGS

The Series TY-B and TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. **Failure to do so may impair the performance of these devices.**

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or sprinkler manufacturer should be contacted with any questions.

### Model/Sprinkler Identification Numbers

#### Stainless Steel-Standard Response

TY8191 - Upright 5.6K, 1/2"NPT  
TY8291 - Pendent 5.6K, 1/2"NPT  
TY9191 - Upright 8.0K, 3/4"NPT  
TY9291 - Pendent 8.0K, 3/4"NPT

#### Stainless Steel-Quick Response

TY8181 - Upright 5.6K, 1/2"NPT  
TY8281 - Pendent 5.6K, 1/2"NPT  
TY9181 - Upright 8.0K, 3/4"NPT  
TY9281 - Pendent 8.0K, 3/4"NPT

#### SMO-Standard Response

TY8192 - Upright 5.6K, 1/2"NPT  
TY8292 - Pendent 5.6K, 1/2"NPT

#### SMO-Quick Response

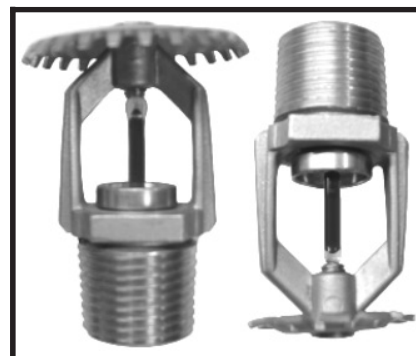
TY8182 - Upright 5.6K, 1/2"NPT  
TY8282 - Pendent 5.6K, 1/2"NPT

#### Titanium-Standard Response

TY8193 - Upright 5.6K, 1/2"NPT  
TY8293 - Pendent 5.6K, 1/2"NPT

#### Titanium-Quick Response

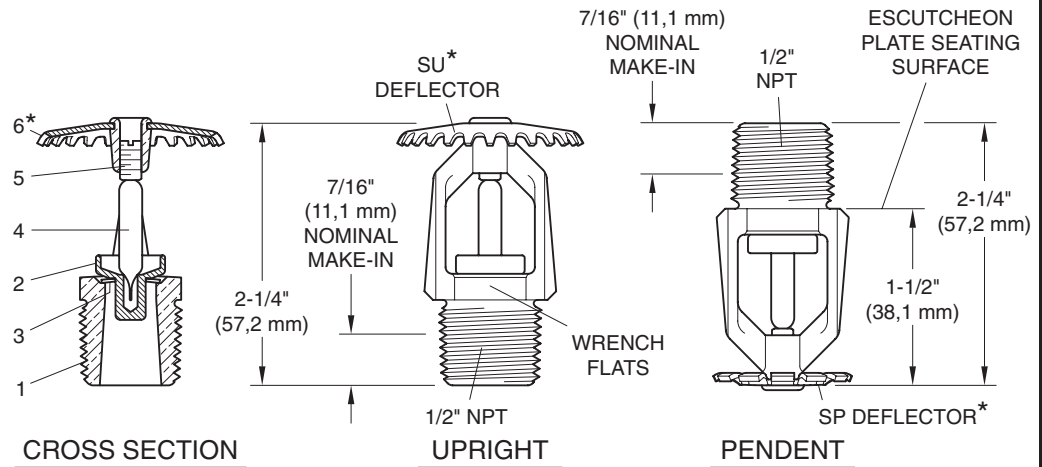
TY8183 - Upright 5.6K, 1/2"NPT  
TY8283 - Pendent 5.6K, 1/2"NPT



Components:

- 1 - Frame
- 2 - Button
- 3 - Sealing Assembly
- 4 - Bulb
- 5 - Compression Screw
- 6 - Deflector \*

\* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

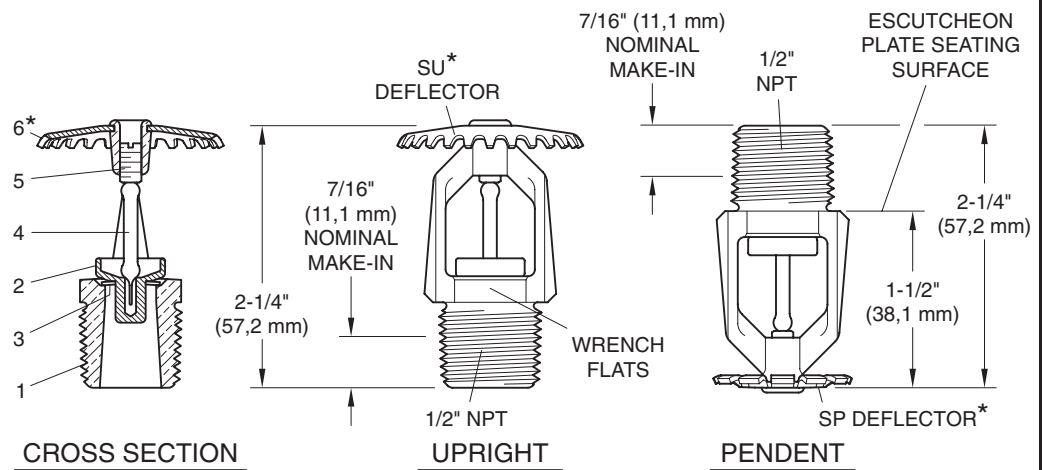


**FIGURE 1**  
**STANDARD RESPONSE SERIES TY-B**  
**STAINLESS STEEL UPRIGHT (TY8191) AND PENDENT (TY8291) SPRINKLERS**  
**SMO UPRIGHT (TY8192) AND PENDENT (TY8292) SPRINKLERS**  
**TITANIUM UPRIGHT (TY8193) AND PENDENT (TY8293) SPRINKLERS**  
**5.6 K-FACTOR, 1/2 INCH NPT**

Components:

- 1 - Frame
- 2 - Button
- 3 - Sealing Assembly
- 4 - Bulb
- 5 - Compression Screw
- 6 - Deflector \*

\* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

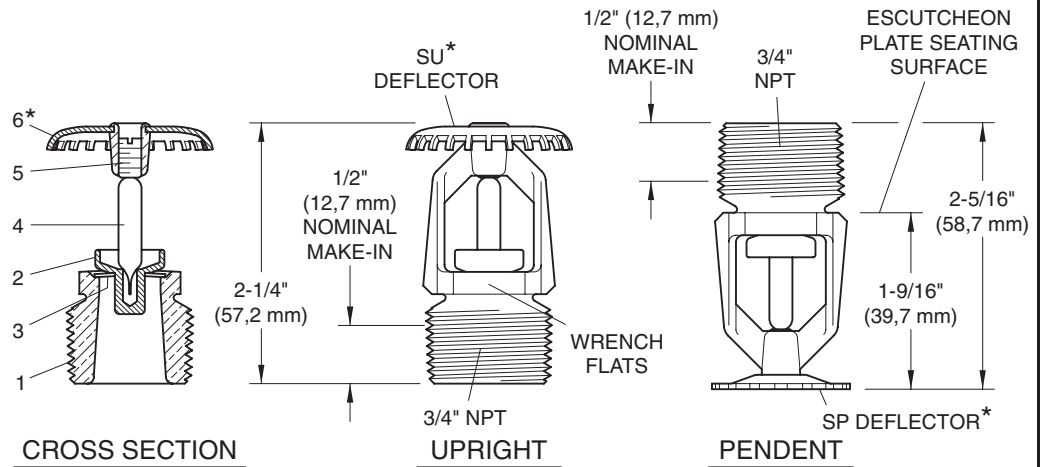


**FIGURE 2**  
**QUICK RESPONSE SERIES TY-FRB**  
**STAINLESS STEEL UPRIGHT (TY8181) AND PENDENT (TY8281) SPRINKLERS**  
**SMO UPRIGHT (TY8182) AND PENDENT (TY8282) SPRINKLERS**  
**TITANIUM UPRIGHT (TY8183) AND PENDENT (TY8283) SPRINKLERS**  
**5.6 K-FACTOR, 1/2 INCH NPT**

Components:

- 1 - Frame
- 2 - Button
- 3 - Sealing Assembly
- 4 - Bulb
- 5 - Compression Screw
- 6 - Deflector \*

\* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.

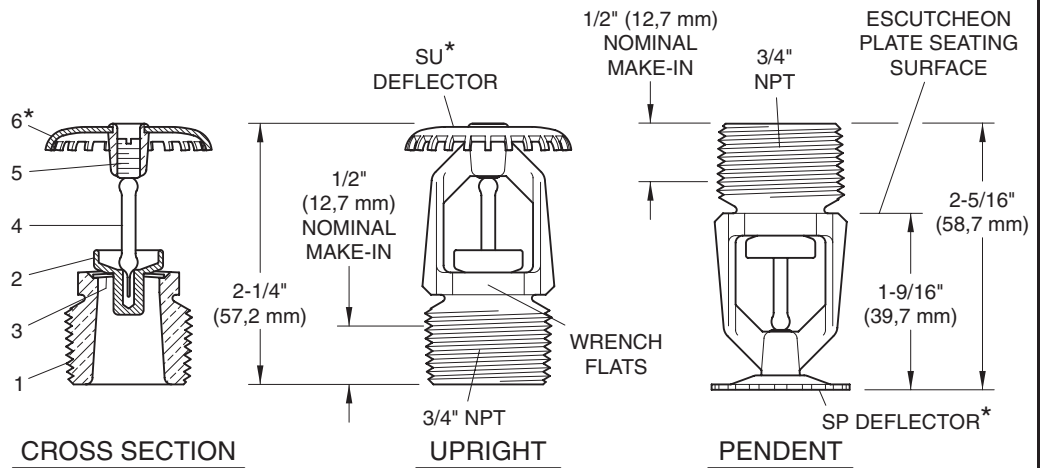


**FIGURE 3**  
**STANDARD RESPONSE SERIES TY-B**  
**STAINLESS STEEL UPRIGHT (TY9191) AND PENDENT (TY9291) SPRINKLERS**  
**8.0 K-FACTOR, 3/4 INCH NPT**

Components:

- 1 - Frame
- 2 - Button
- 3 - Sealing Assembly
- 4 - Bulb
- 5 - Compression Screw
- 6 - Deflector \*

\* Temperature rating is indicated on deflector or adjacent to orifice seat on frame.



**FIGURE 4**  
**QUICK RESPONSE SERIES TY-FRB**  
**STAINLESS STEEL UPRIGHT (TY9181) AND PENDENT (TY9281) SPRINKLERS**  
**8.0 K-FACTOR, 3/4 INCH NPT**

## Technical Data

### Approvals

Refer to Table A.

### Maximum Working Pressure

175 psi (12,1 bar)

### Discharge Coefficient

$K = 5.6 \text{ GPM/psi}^{1/2}$  (80,6 LPM/bar<sup>1/2</sup>)

$K = 8.0 \text{ GPM/psi}^{1/2}$  (115,2 LPM/bar<sup>1/2</sup>)

### Temperature Ratings

Refer to Table A.

### Physical Characteristics

#### Stainless Steel

The frame is Stainless Steel, ANC4FC, per BS 3146 PT 2. The Deflector is Type 316L (UNS 31603) Stainless Steel per ASTM A479/479M or BS EN 10088 WN1.4401/4404. The Compression Screw and Button are Type 316L (UNS 31603) Stainless Steel per ASTM A479/479M or BS EN 10088 WN1.4404. The Sealing Assembly consists of a Disc Spring that is sealed on both its inside and outside faces with a Teflon\* Gasket. The Disc Spring is 1/2 Hard Beryllium Nickel (UNS NO3360) Gold Plated per MIL G-45204, Type 3, Class 2. The Bulb is Glass.

#### SMO

The Frame, Deflector, Compression Screw, and Button are 254 SMO\*\* Duplex Stainless Steel per UNS S31254. The Sealing Assembly consists of a Disc Spring that is sealed on both its inside and outside faces with a Teflon\* Gasket. The Disc Spring is 1/2 Hard Beryllium Nickel (UNS NO3360) Gold Plated per MIL G-45204, Type 3, Class 2. The Bulb is Glass.

#### Titanium

The Frame is Titanium, Grade 2 per UNS R50400. The Deflector is Titanium, Grade 2 per ASTM B265-03. The Compression Screw is Titanium, Grade 5 per ASTM B348-03. The Button is Titanium, Grade 2 per ASTM B348. The Sealing Assembly consists of a Disc Spring that is sealed on both its inside and outside faces with a Teflon\* Gasket. The Disc Spring is Titanium 6AL/4V Ti per AMS4911J. The Bulb is Glass.

\* Teflon is a DuPont registered trademark.

\*\* 254 SMO is a Avesta Sheffield registered trademark.

## Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

## Design Criteria

The Series TY-B and TY-FRB Pendent and Upright Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13).

## Installation

The Series TY-B and TY-FRB Sprinklers must be installed in accordance with the following instructions:

### NOTES

*Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 360°F/182°C temperature ratings.*

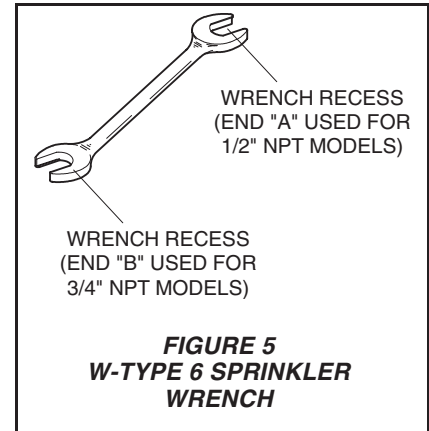
*A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. A leak tight 3/4 inch NPT sprinkler joint should be obtained with a torque of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install sprinklers with 3/4 NPT connections. Higher levels of torque may distort the sprinkler inlet and cause leakage or impairment of the sprinkler.*

*Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.*

The **Series TY-B and TY-FRB Pendent and Upright Sprinklers** must be installed in accordance with the following instructions.

**Step 1.** Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed in the upright position.

**Step 2.** With pipe thread sealant ap-



plied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

**Step 3.** Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 5). With reference to Figures 1, 2, 3, and 4 the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.

MODEL K RESPONSE	TYPE	TEMP. RATING	BULB LIQUID COLOR	SPRINKLER MATERIAL		
				STAINLESS STEEL	SMO	TITANIUM
TY-B 5.6 1/2" NPT SR	PENDENT and UPRIGHT	135°F/57°C	Orange	1, 2	NAS	
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
		360°F/182°C	Mauve			
TY-FRB 5.6 1/2" NPT QR	PENDENT and UPRIGHT	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
TY-B 8.0 3/4" NPT SR	PENDENT and UPRIGHT	135°F/57°C	Orange	N/A		
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			
		360°F/182°C	Mauve			
TY-FRB 8.0 1/2" NPT QR	PENDENT and UPRIGHT	135°F/57°C	Orange			
		155°F/68°C	Red			
		175°F/79°C	Yellow			
		200°F/93°C	Green			
		286°F/141°C	Blue			

**NOTES:**

- 1. Listed by Underwriters Laboratories, Inc. (UL).
  - 2. Listed by Underwriters Laboratories, Inc. for use in Canada (C-UL).
- NAS: No Approval Status.  
 N/A: Not Available.

**TABLE A  
LABORATORY LISTINGS AND APPROVALS**

## Care and Maintenance

The Series TY-B and TY-FRB Sprinklers must be maintained and serviced in accordance with the following instructions:

### NOTES

*Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.*

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers - before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

Frequent visual inspections are recommended to be initially performed for corrosion resistant sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant material of construction. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant material of construction, as it may be affected by the corrosive conditions present.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. The installing contractor or sprinkler manu-

facturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

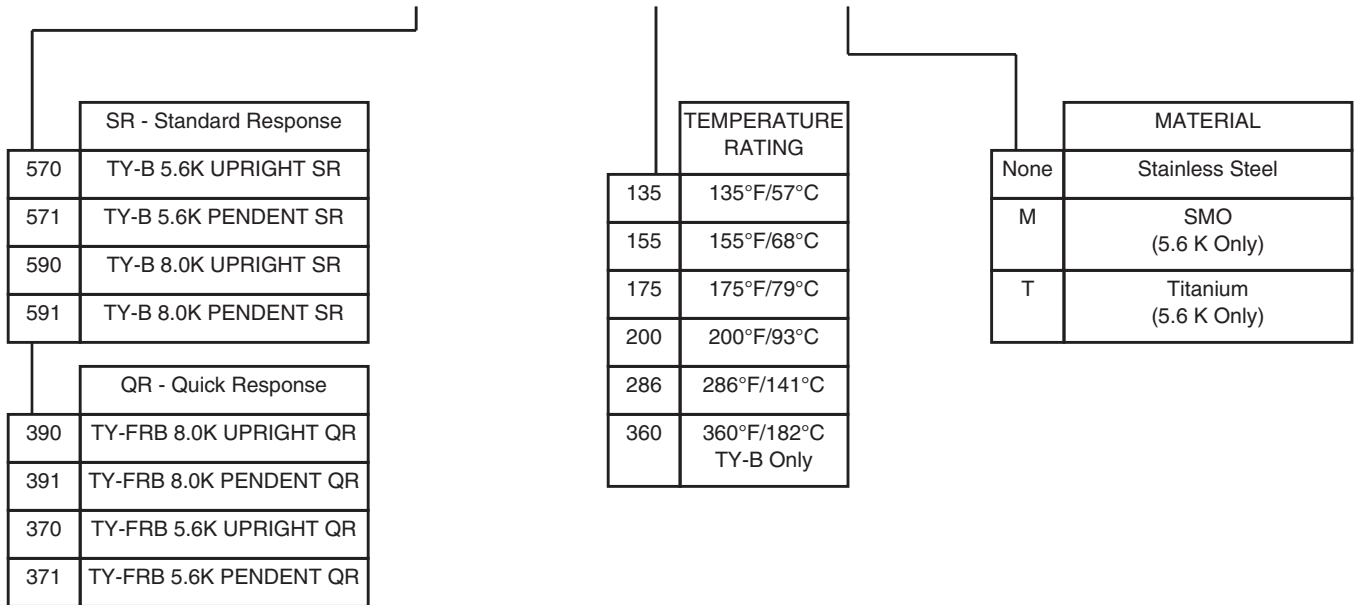
## Limited Warranty

Products manufactured by Tyco Fire & Building Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire & Building Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire & Building Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire & Building Products to be defective shall be either repaired or replaced, at Tyco Fire & Building Products' sole option. Tyco Fire & Building Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire & Building Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE & BUILDING PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE & BUILDING PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE & BUILDING PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

**THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

P/N 57 — XXX — 0 — XXX — SUFFIX



**TABLE B**  
**PART NUMBER SELECTION**  
**SERIES TY-B AND TY-FRB PENDENT AND UPRIGHT SPRINKLERS**  
**ALTERNATE MATERIALS OF CONSTRUCTION**

## Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

Contact your local distributor for availability.

### Sprinkler Assemblies with NPT Thread Connections:

Specify: (Specify Model/SIN), (Specify Standard Response or Quick Response), (specify K-factor), (specify temperature rating), (specify Pendent or Upright) Sprinkler with (specify type material: Stainless Steel, SMO, or Titanium), P/N (specify from Table B).

### Sprinkler Wrench:

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387.

